

Claims

What we claim is:

Sub 5
C1 1. A method of inducing apoptosis of a selected group of vertebrate cells *in vivo*, comprising administering to a vertebrate comprising said cells a thiaminase or derivative or a nucleic acid molecule encoding a thiaminase or derivative, thereby reducing the level of thiamin in said cells.

Rule 10
1.126 2 The use of a thiaminase or derivative or nucleic acid encoding a thiaminase or derivative in the preparation of a medicament for the treatment of a disease or condition in a mammal wherein the reduction or elimination of a selected group of cells of said organism produces a therapeutic effect, and
15 wherein said thiaminase or derivative is able to induce apoptosis by reduction of the level of thiamin.

Sub 5
C2 20 3. A method for delivering a nucleic acid sequence encoding a thiaminase or derivative to vertebrate cells *in vivo*, comprising the step of contacting said cells with a vector comprising said nucleic acid sequence.

25 4. A pharmaceutical composition comprising at least one thiaminase or derivative and a pharmaceutically acceptable carrier or excipient.

5. The pharmaceutical composition of claim 4, further comprising a delivery-targeting component.

30 6. The composition of claim 4, wherein said composition is sterile.

Rule
1.126

7
6. A method of killing a selected group of vertebrate cells *in vivo*, comprising the steps of:

a) contacting said cells with a thiaminase or thiaminase derivative, thereby reducing the level of thiamin in said cells; and

5 b) administering to a vertebrate animal having said selected group of cells an accessory treatment which enhances the effectiveness of the thiamin reduction.

8
8. A purified, enriched, or isolated nucleic acid sequence encoding a thiaminase or derivative, wherein said thiaminase agent is different from *Bacillus thiaminolyticus* thiaminase I.

9
9. The nucleic acid sequence of claim 7, wherein said thiamin-depleting agent is a *Naegleria gruberi* thiaminase or derivative, or a homolog thereof.

Sub
C3 10
10. A eukaryotic expression vector comprising a recombinant nucleic acid sequence of claim 8.

11
11. A vector comprising a recombinant nucleic acid sequence of claim 8, wherein said thiaminase or derivative is different from a thiaminase from *Bacillus thiaminolyticus*.

12
12. A eukaryotic cell transformed with a eukaryotic expression vector comprising a nucleic acid sequence encoding a thiaminase or derivative.

13
13. The eukaryotic cell of claim 11, wherein said cell is *in vivo* in a vertebrate organism.

- ~~14~~
~~13~~ A composition for delivery of a nucleic acid sequence encoding a thiaminase or derivative to vertebrate cells *in vivo*, comprising:
- 5 a) a nucleic acid sequence encoding said thiaminase or derivative; and
b) a component associated with said nucleic acid sequence which enhances said delivery of said nucleic acid.

- ~~15~~
~~14~~ A method of killing a selected group of vertebrate cells *in vivo*, comprising the steps of:
- 10 a) reducing the level of thiamin in said cells by contacting said cells with a thiaminase or derivative; and
b) administering to a vertebrate animal having said selected group of cells an accessory treatment which enhances the effectiveness of the thiamin
- 15 reduction.

- ~~16~~
~~15~~ An isolated, purified, or enriched thiaminase or derivative, wherein said thiaminase is not a *Bacillus thiaminolyticus* thiaminase.

- 20 ~~17~~
~~16~~ The thiaminase or derivative of claim 15, wherein said thiaminase or derivative is a homolog of a *Naegleria gruberi* thiaminase or derivative.

add
c4